BEFORE THE BOARD OF PILOT COMMISSIONERS FOR THE BAYS OF SAN FRANCISCO, SAN PABLO, AND SUISUN

In re the Interaction Between the	)
M/V HYUNDAI NEPTUNE and the	)
M/V THALASSA AVRA While Passing	)
Berth 37 at the Port of Oakland on	)
May 21, 2020	)
Pilot: Captain Drew Aune.	)
	)

The Board of Pilot Commissioners commenced hearing of this matter at its meeting of January 27, 2022. The meeting was conducted remotely, using Webex Meetings and telephone call-in. Present at the hearing were the following Commissioners: President Joanne Hayes-White, presiding, and Commissioners Robert Carr, Einar Nyborg, Oscar Prada, and Karen Tynan. Also present as a non-voting member of the Board was Stephanie Dougherty, representing Elissa Konove, Acting Secretary of the California State Transportation Agency. The Incident Review Committee was represented by Vice President Jennifer Ferrera Schmid and Executive Director Allen Garfinkle. Captain Drew Aune did not appear and was not represented by counsel. Executive Director Garfinkle introduced the report of the IRC into evidence as well as additional documentary evidence. Mr. Garfinkle addressed the Board concerning the IRC report and responded to questions. At the conclusion of the hearing, the public record was closed and the Board adjourned to closed session to deliberate.

Because Commissioner Tynan was unable to participate in the closed session, the closed session was adjourned to a later date to allow her participation. The closed session resumed at the Board meeting of February 24, 2022.

Having considered the evidence and the statements of Executive Director Garfinkle, the Board makes the following determinations:

FINDINGS

1. On the morning of May 21, 2020, at approximately 0415 hours, Captain Drew Aune boarded the inbound container ship HYUNDAI NEPTUNE off the city

front, relieved the pilot who had brought the ship in from sea, and took the conn. The ship was bound for Berth 25 in the Outer Harbor of the Port of Oakland.

2. The plan for the transit to Berth 25 was to pass through the Delta-Echo span of the Bay Bridge, then turn left along the right or southerly side of the Oakland Bar Channel and across the mouth of the Oakland Estuary, then put the vessel on the centerline of the narrower Outer Harbor Entrance Channel as the ship approached the Ben E. Nutter Terminal. This centering of the ship in the Outer Harbor Entrance Channel after bearing to the right side of the Bar Channel because of the ebb current was important because, as Captain Aune was aware, an ultra-large container vessel, the THALASSA AVRA, was moored port-side-to at Berth 37, with its stern alongside Berth 35. Berth 37 is the first berth at which an inbound vessel passes parallel to a terminal berth, thereby creating the potential for interaction with any vessel moored there.

3. This planned maneuver in the Bar Channel can be difficult if there is an ebb tide, especially with a vessel alongside Berth 37. An ebb tide coming out of the South Bay will carry a vessel in a northerly direction, toward the shoals on the north side of the Outer Harbor Entrance Channel. The HYUNDAI NEPTUNE's length overall is 1,014 feet. The vessel was exposed to significant lateral movement (set) due to an ebb current on the starboard beam, setting the vessel to the left or north side of the channel. To mitigate the force that an ebb tide exerts on a vessel that is transiting the Oakland Bar Channel and inbound for the Outer Harbor, a pilot must hold to the right side of the channel, holding high into the current and simultaneously reducing speed, allowing the vessel to set into the middle of the channel to safely pass Berth 37. The goal is to maneuver the vessel to the middle of the channel or slightly left of center, moving as slowly as possible to minimize vessel interaction when passing the moored vessel at Berth 37.

4. Captain Aune stated that the predicted ebb current in the Bar Channel was one knot. As measured at the nearest tidal current station, the maximum ebb current was 1.19 knots at 0239 hours. Slack water occurred at 0637 hours. In between those two times, at 0437 hours—which was the time of the interaction between the HYUNDAI NEPTUNE and the THALASSA AVRA—the ebb current was estimated at between 0.6 and 0.85 knots.

5. During the Oakland Bar Channel transit, Captain Aune ordered slow-ahead and dead-slow-ahead bells, except for a quick half-ahead bell for steerage near Buoy 2A on the right side of the Bar Channel. This half-ahead engine order is

evidence of the sluggish steering of Capt. Aune's vessel. Just prior to his bow passing the western end of the terminal, he ordered the two tugs that had lines made up (one to the center-lead aft and one to the starboard bow) to pull at three-quarters power straight back and alongside, respectively, to slow the ship. And as soon as he felt comfortable with steerage and the prevailing current, he stopped the vessel's engines and continued to back both tugs at three-quarters power to assist bringing down its speed. Stopping the engine of such a large vessel entering the severe current shear at the end of Berth 37 indicates Captain Aune's awareness of his speed and his effort to reduce it. Coming astern at this location is considered unacceptable due to the complete loss of heading control that would result. He had a third tug at his disposal, but this tug was left untethered in reserve to assist the starboard quarter in the subsequent turn at Berth 34.

6. Although the speeds reported in the IRC report are not entirely consistent, we conclude that the approximate speeds of the HYUNDAI NEPTUNE (a forward-house ship) were, at various points in the transit, as follows:

- Bow passing the western end of the Nutter terminal: 7.8–8.0 knots
- Bow-to-bow with the THALASSA AVRA: 7.7 knots
- Bow-to-stern with the THALASSA AVRA: 6.9 knots
- Bridge wing passing stern of the THALASSA AVRA: 6.0 knots
- Quarter passing stern of the THALASSA AVRA: 5.7 knots
- Stern-to-stern with the THALASSA AVRA: 5.2 knots

7. The THALASSA AVRA was moored with 16 mooring lines. Captain Aune reported that, as he was completing passage by the THALASSA AVRA, he heard two very loud bangs in quick succession. He immediately glanced at the radar and noted that his speed was indicated as 6.2 knots. The sound was the parting of four headlines and two after spring lines of the THALASSA AVRA. The THALASSA AVRA's stern moved away from the berth and the ship rotated counter-clockwise, with its bow swinging over the dock and contacting a container gantry crane. Costs to repair the crane totaled $274,128.96. Total losses, including the terminal operator's loss of use of the crane, were estimated at $768,000.

8. It is difficult to determine whether the THALASSA AVRA was properly moored. The ship departed within two hours of the incident, so there was no opportunity for a Board investigator to board the ship to assess and verify the mooring arrangements. The IRC report noted the following facts, all of which suggested improper mooring: (a) the ship had begun to move away from the dock before the lines parted, indicating that there was slack in the lines; (b) the ship had

completed cargo operations about 13 minutes prior to the lines parting, giving the one able seaman who was making the deck rounds to inspect the lines very little time prior to the interaction to make a thorough inspection or make any necessary adjustments in line tension prior to a departure that was expected relatively soon; and (c) 45 minutes after the interaction, when another ship, the HANOVER EXPRESS, passed the THALASSA AVRA at a speed of 3.2 knots (the lower speed being possible because this later transit was made at slack tide), a head line parted despite the lower passing speed and three tugs pushing on the THALASSA AVRA.

9. Four of the principal elements that contribute to hydraulic interaction are: (a) vessel speed, (b) depth of water, (c) proximity to the moored vessel, and (d) size of the passing vessel and size of the moored vessel.

10. Concerning vessel speed, the Coast Guard Incident Investigation Report concluded that "Speed was deemed necessary due to strong current present." We agree with the Coast Guard's conclusion concerning vessel speed. The ebb current did not exceed the maximum allowable current speed for a vessel of the HYUNDAI NEPTUNE's length and draft inbound to the Oakland Outer Harbor. The current speed was beneath the maximum current speed under both the 2017 Operations Guidelines of the San Francisco Bar Pilots (maximum ebb current 1.25 knots) and the SFBP's 2021 Operations Guidelines, as amended after this incident (maximum ebb current 1.0 knots). While both the 2017 and 2021 Guidelines permitted a transit at the ebb current speed present in this case, an elevated vessel speed was still necessary to maintain steerage and resist the force of the ebb tide when making the turn through the Oakland Bar Channel and crossing the tidal current.

11. Concerning depth of water, the HYUNDAI NEPTUNE's calculated under-keel clearance of 6 feet 11 inches exceeded the four-foot minimum UKC prescribed by the SFBP Guidelines for the Oakland Bar Channel and the Oakland Outer Harbor Channel.

12. Concerning proximity of the passing vessel to the berthed vessel, the combined beam widths of the HYUNDAI NEPTUNE, the THALASSA AVRA, the tug on the HYUNDAI NEPTUNE's starboard bow, and an outbound vessel that showed on the Vessel Traffic Service playback left a limited corridor in which to navigate. Of the approximate 720-foot width of the Outer Harbor Channel, only about 60 yards were left for maneuver on either side of the HYUNDAI

NEPTUNE, and that is without considering the allowance that would have to be made for passage of the outbound vessel that showed on the VTS playback. Of necessity, the HYUNDAI NEPTUNE had to pass closer to the THALASSA AVRA than the pilot might have wished. This factor, however, was beyond the control of the pilot.

13. Concerning the final element of vessel size, we view that to be of critical importance in reviewing this incident. Together, the passing vessel and the moored vessel occupy a percentage of the channel width and depth. The higher this percentage is, the less room the water in the channel has to displace around the vessels, causing increased water velocity, vessel interaction, and increased forces on the mooring lines. The larger the passing vessel, the larger the volume of water the vessel displaces as it proceeds on its course, the larger the volume of water that fills in behind the vessel after its passage, and the larger the force that pulls an adjacent moored vessel off the berth in response to water rushing to fill the temporary trough caused by the passing vessel. In recent years, the length of container vessels has increased significantly. What is sometimes lost sight of, however, the beam width of these ultra-large container vessels has also increased significantly, causing a large increase in vessel displacement. Some of the new, larger container vessels that are now calling at the Port of Oakland can carry a width of 22 containers loaded side by side. The volume of water displaced by these ULCVs is determined not just by vessel length, but also by vessel width. Together, length and width contribute to overall vessel displacement. And it is the overall displacement of a passing vessel and a moored vessel that affects the extent of interaction between the two vessels. The various restrictions of the SFBP's Operations Guidelines take into account vessel length but do not expressly incorporate consideration of vessel width. After this incident, the SFBP Operations Guidelines were amended to reduce the maximum ebb current speed for this length of vessel, with the understanding that the new, higher displacement class fit into this length category and required more caution.

14. Two technical reports involving hydrodynamic modeling and dynamic mooring analysis, both focused on ULCVs, have been done for the Port of Oakland by Coast & Harbor Engineering, one in 2011 and one in 2015. Both reports viewed the passing of a moored vessel at Berth 37 to be highly problematic in certain situations.

15. As with vessel proximity, vessel size was beyond the control of Captain Aune.

CONCLUSIONS

1. Section 1181 of the Harbors and Navigation Code provides that a pilot's license may be suspended or revoked for reasons of "misconduct." In situations of pilot misconduct, the Board may file an accusation seeking suspension or revocation of the pilot's license after a formal hearing under section 11500 and following of the Government Code. (See Harb. & Nav. Code, §§ 1181, subd. (a), 1182; tit. 7, Cal. Code Regs., § 210, subd. (e)(1).) In situations where the Board does not seek suspension or revocation of a pilot's license, it may, after an informal hearing, take other types of corrective action as provided in section 210, subdivision (e)(2)–(7) of the Board's regulations.

2. Section 1181 of the Code specifies a range of actions that constitute "misconduct," including "negligently, ignorantly, or willfully running a vessel on shore, or otherwise rendering it liable to damage or otherwise causing injury to persons or damage to property." (§ 1181, subd. (g).) Further, section 210, subdivision (h)(5) of the Board's regulations lists "negligently performing duties related to vessel navigation" as a type of misconduct.

3. The negligence standard of care calls for an evaluation whether a pilot exercised that degree of care and skill possessed by the "average pilot."

4. Importantly, a finding of misconduct is not necessary for the Board to order action that will reduce the potential for similar incidents occurring in the future. Section 210, subdivision (e)(2) of the regulations confers broad discretionary authority on the Board to "[terminate] the matter on such terms and conditions as the Board considers acceptable."

5. From the evidence presented, it is not clear that the "average pilot" would have performed better than did Captain Aune under these circumstances. Given the ebb current and the need to maintain steerage, he had to maintain sufficient speed to make the turn in the Oakland Bar Channel, cross the ebb current, and then quickly reduce speed as he entered the Outer Harbor Entrance Channel. With the aid of his engine commands and the two made-up tugs backing at three-quarters power, he was able to substantially slow the HYUNDAI NEPTUNE as it passed the THALASSA AVRA. It is possible that making up and backing the third tug might have aided in slowing the vessel even more, but as it was, he was able to quickly reduce speed in a fairly short period. Concerning vessel proximity, he was

constrained to pass closer to the THALASSA AVRA than he might have wished, but he had little choice, given that the maneuvering space in the Outer Harbor Entrance Channel was narrowed by the combined beam widths of the two ULCVs, the tug on the starboard bow, and the outbound vessel shown on the VTS playback. Concerning causation for the lines parting, there is some evidence that suggests that the THALASSA AVRA was not properly moored.

6. Based on the evidence, we conclude that the size of both the HYUNDAI NEPTUNE and the THALASSA AVRA was the principal contributing factor to the interaction between the two vessels. The combined beam widths of these two ultra-large container vessels contributed to their increased proximity to one another. Further, the size of the HYUNDAI NEPTUNE caused a large displacement of water adjacent to the THALASSA AVRA, thereby generating a powerful force that pulled the moored vessel off the dock and snapped its mooring lines.

7. Both the 2011 and the 2015 studies by Coast & Harbor Engineering identify Berth 37 as a high-risk location where "higher passing speeds and closer passing distances result in much larger forces than are present at other terminals," and that "for worst-case condition no margin of safety exists." As the IRC report notes, these conclusions derive from the highest speed used in these studies: 5.2 knots. That is the speed reached by Captain Aune when passing the THALASSA AVRA.

8. The size of these two ULCVs was beyond the pilot's control. In the last two years, larger container vessels have begun calling at the Port of Oakland. There are clearly challenges presented when an inbound ULCV on a strong ebb current encounters another ULCV moored at Berth 37.

9. We conclude that the pilot's actions here are insufficient to constitute "misconduct" within the meaning of the Code and the Board's regulations.

10. Regardless of whether this incident involved "misconduct," there is a need for the pilots to review how and why this incident occurred and to consider means of avoiding similar incidents in the future.

ORDER

1. Captain Aune shall prepare a written report explaining this interaction and how such interactions at Berth 37 involving inbound ULCVs on an ebb current can be avoided in the future. The report shall be reviewed and approved by the Port Agent. Within 60 days of the date of this Order, the report shall be presented to the pilots in written form and shall be discussed with all pilots orally in an online meeting or meetings. Within 60 days of the date of this Order, Captain Aune shall provide the report to the Executive Director and report back to the Executive Director that the foregoing requirements have been met.

2. The Port Agent shall distribute to all existing and future pilots the two studies by Coast & Harbor Engineering and all similar studies completed in the future.

DATED: March 24, 2022

Joanne Hayes-White

JOANNE HAYES-WHITE
President, Presiding